UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/578,879	03/09/2007	Steve Arscott	1034404-000002	5040

21839 7590 02/19/2010

BUCHANAN, INGERSOLL & ROONEY PC
POST OFFICE BOX 1404
ALEXANDRIA, VA 22313-1404

EXAMINER	
CHANG, HANWAY	

ART UNIT	PAPER NUMBER
2881	

NOTIFICATION DATE	DELIVERY MODE
02/19/2010	ELECTRONIC

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Notice of the Office communication was sent electronically on above-indicated "Notification Date" to the following e-mail address(es):

ADIPFDD@bipc.com
offserv@bipc.com

Office Action Summary	Application No.	Applicant(s)	
	10/578,879	ARSCOTT ET AL.	
	Examiner	Art Unit	
	Hanway Chang	2881	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE *3* MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *17 December 2009*.

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-14 and 19-22* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-14 and 19-22* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *11 May 2006* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☒ All b)☐ Some * c)☐ None of:

1.☒ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☐ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

Response to Arguments

Applicant's arguments filed 12/17/2009 have been fully considered but they are not persuasive.

Applicant has argued that channel 56 is a tubular channel and is not formed through a complete thickness of the tip of the microchip 50. Examiner disagrees. As shown in Fig. 4a of Zimmermann et al. (US Pat. 6,602,472, hereinafter Zimmermann) discloses the channel 56 is formed through a complete thickness of the tip. Examiner takes the position that complete thickness of the tip may be any dimension of the tip depending on the point of view what the thickness of the tip is. For instance, from the side profile, the channel is formed through the complete thickness of the tip. Therefore the channel 56 is formed through the complete thickness of the length of the tip.

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

Claims 1-6, 8-9, 11-14, and 19 are rejected under 35 U.S.C. 102(b) as being anticipated by Zimmermann.

Regarding claim 1, Fig. 4a of Zimmermann discloses an electrospray source (50) having at least one flat and thin tip (47) (see col. 6, lines 28-31) in cantilever in relation

to the rest of the structure, the tip (57) being provided with a capillary slot (56) (see col. 6, lines 28-31) formed through the complete thickness of the tip and which ends up at the end of the tip (57) to form the ejection orifice of the electrospray source, the source comprising means of supplying (55) the capillary slot (56) with liquid to be nebulised and means of applying an electrospray voltage to the liquid (see col. 6, lines 28-37). It should be noted that the complete thickness of the tip may be any dimension of the tip. Therefore the channel 56 is formed through the complete thickness of the length of the tip.

Regarding claim 2, Fig. 4a of Zimmermann discloses the supply means comprises at least one reservoir (55) in fluidic communication with the capillary slot (56) (see col. 6, lines 28-37).

Regarding claim 3, Fig. 4a of Zimmermann discloses the structure comprises a wafer (50) which supports the tip (57) (see col. 6, lines 11-43).

Regarding claims 4 and 13, Figs. 1 and 4a of Zimmermann discloses the supply means comprises a reservoir (55) constituted by a recess formed in the wafer (50) and in fluidic communication with the capillary slot (56) (see col. 6, lines 34-37).

Regarding claims 5 and 14, Fig. 4a of Zimmermann discloses at least one electrode (57) arranged so as to be in contact with the liquid to be nebulised (see col. 6, lines 28-37). It should be noted that in order for the liquid to be sprayed as disclosed above, a means of applying a voltage must inherently be present.

Regarding claim 6, Fig. 4a of Zimmermann discloses that the wafer is at least partially electrically conductive (see col. 6, lines 31-34).

Regarding claim 8, Fig. 4a of Zimmermann discloses the supply means comprises a capillary tube (56) (see col. 6, lines 28-31).

Regarding claim 9, Fig. 4a of Zimmermann discloses the supply means comprises a channel (51) formed in a microsystem supporting the structure and in fluidic communication with the capillary slot (56) (see col. 6, lines 18-31).

Regarding claim 11, Fig. 4a of Zimmermann discloses the formation of the support from a substrate, formation of a wafer (50) having a part constituting a flat and thin tip (57), the tip being provided with a capillary slot (56) to convey a liquid to be nebulised, formed in the complete thickness of the tip and which ends up the end of the tip, and making the wafer (50) integral on the support, the tip (57) being in cantilever in relation to the support (see col. 6, lines 11-43). It should be noted that the complete thickness of the tip may be any dimension of the tip. Therefore the channel 56 is formed through the complete thickness of the length of the tip.

Regarding claim 12, Fig. 4a of Zimmermann discloses providing the substrate (50) to form the support, the delimitation of the support by means of trenches etched in the substrate, deposition, on a zone of the substrate corresponding to the future tip (57) of the structure, of sacrificial material according to a determined thickness, the deposition of the wafer on the support delimited in the substrate, the tip (57) of the wafer being situated on the sacrificial material, the elimination of the sacrificial material, and the detachment of the support in relation to the substrate by cleavage at the level of the trenches (see col. 6, lines 11-43).

Regarding claim 19, Fig. 4a of Zimmermann discloses electrospraying the liquid and analyzing the liquid by mass spectrometry (see col. 6, lines 31-34).

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

Claims 7 and 20-22 are rejected under 35 U.S.C. 103(a) as being unpatentable over Zimmermann.

Regarding claim 7, Fig. 4a of Zimmermann discloses that the tip (57) microsprays the liquid (see col. 6, lines 31-34), but in that embodiment, Zimmerman does not specifically teach the channel is an electrically conductive wire. However, Zimmerman teaches the passage can be metallised, which allows the substance to be conveyed to be microsprayed electro-osmotically (see col. 6, lines 59-64). It should be noted that a channel made of metal can be viewed as a conductive wire in contact with the liquid drawing out the sample from the reservoir to be microsprayed through electrical means is applying a voltage to the metal channel.

In view of such teaching, it would have been obvious to the ordinary skill in the art at the time the invention was made to modify the channel (56) in contact with a liquid to be metal to apply a voltage to microspray the sample for the purpose of precharging the sample so less power is required to be applied at the tip for spraying the sample.

Regarding claim 20, Fig. 4a of Zimmermann discloses the claimed invention except for controlling the size of the liquid spray. However, it would have been obvious to one having ordinary skill in the art at the time the invention was made to modify the invention of Zimmermann by varying the voltage source applied to the tip to vary the size of the formed droplets because by varying the voltage, the skilled artisan can vary the size of the liquid spray affects the characterization of the ions to be detected, and thus, detecting only the desired properties of the sample. Furthermore, it has been held that discovering an optimum value of a result effective variable involves only routine skill in the art, and one of ordinary skill in the art would have manipulated the voltage to obtain the desired voltage and size of the spray to achieve the correct vaporization for detection. *In re Boesch*, 617 F.2d 272, 205 USPQ 215 (CCPA 1980).

Regarding claims 21, Zimmermann discloses the electrospray source of claim 1 except for using the source to carry out molecular writing. However, it would have been obvious at the time of invention to a person of ordinary skill in the art to modify by the invention of Zimmermann by using the source as taught in any device which utilizes electrospray as a source for molecular writing as art recognized equivalents of a supply of chemical compounds to be sprayed.

Regarding claims 22, Zimmermann discloses the electrospray source of claim 1 except for using the source to define an electrical junction potential of a device. However, it would have been obvious at the time of invention to a person of ordinary skill in the art to modify by the invention of Zimmermann by using the source as taught

in any device which utilizes electrospray as a source for defining an electrical junction potential of a device as art recognized equivalents of a supply of electrosprayed liquid.

Claim 10 is rejected under 35 U.S.C. 103(a) as being unpatentable over Zimmermann in view of Schultz et al. (US Pat. 6,633,031, hereinafter Schultz).

Regarding claim 10, a difference between Zimmerman and the claimed invention is the wafer has a surface hydrophobic to the liquid to be nebulised. However, Schultz discloses the use of a hydrophobic coating on a microchip to improve stability in the process of electrospray (see col. 8, lines 26-43). In view of such teaching, it would have been obvious to the ordinary artisan at the time the invention was made to modify the invention of Zimmermann by having a hydrophobic coating on the wafer for the purpose of improving stability during the electrospray process as taught by Schultz.

Conclusion

THIS ACTION IS MADE FINAL. Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of

the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Hanway Chang whose telephone number is (571)270-5766. The examiner can normally be reached on Monday to Friday 7:30 AM till 4 PM EST.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Robert H. Kim can be reached on (571)272-2293. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

Hanway Chang
February 3, 2010
/H. C./
Examiner, Art Unit 2881

/ROBERT KIM/
Supervisory Patent Examiner, Art Unit 2881